

Education IPY

Two linked projects from Norway

- IPY-Norway web resource centre for schools
- International global school campaign

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International global school campaign





Project outline 1

- ❖ Schools take flesh sample of local fish
- ❖ Schools sends sample to NILU laboratory
- ❖ NILU **analysis** all samples for dioxin related pollutants – bioassay measurement technique
- ❖ Schools retrieves raw data result
- ❖ Schools retrieves relevant findings from Arctic and Antarctic observations of similar compounds



Background



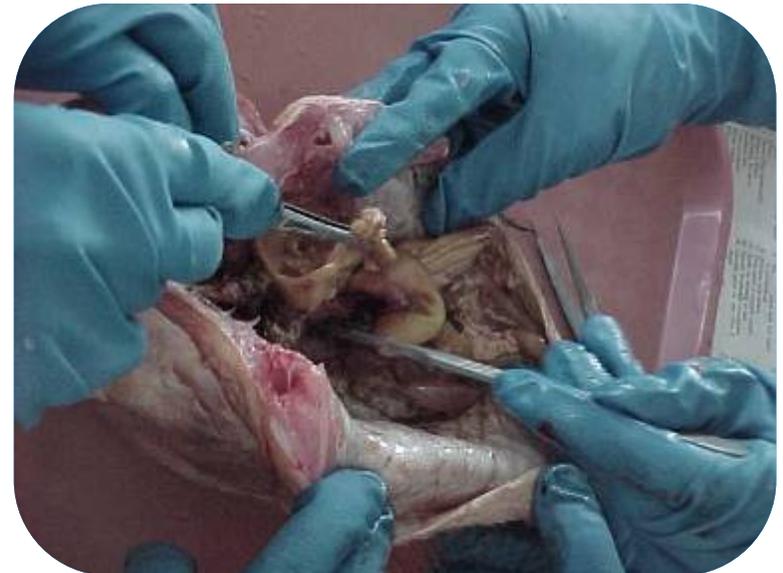
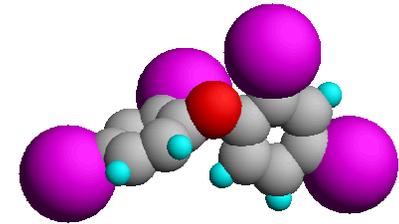


Builds on years of experience

- ❖ Yearly campaigns with hundred of schools in Norway where pupils performs a national scientific study.
- ❖ GLOBE Arctic project 2000-2004
– POPs in The Arctic.

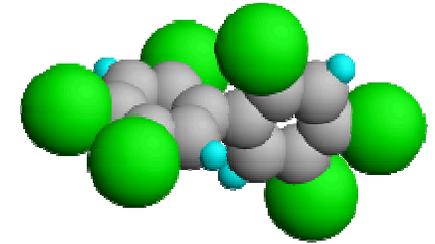
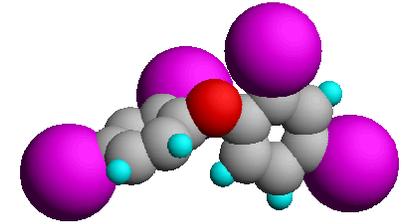


The Arctic POPs project



POPs investigated

- ❖ **Brominated flame retardants**
(PBDE 47=
2,2',4,4'-tetrabromodiphenylether)
- ❖ **PCBs as reference group**



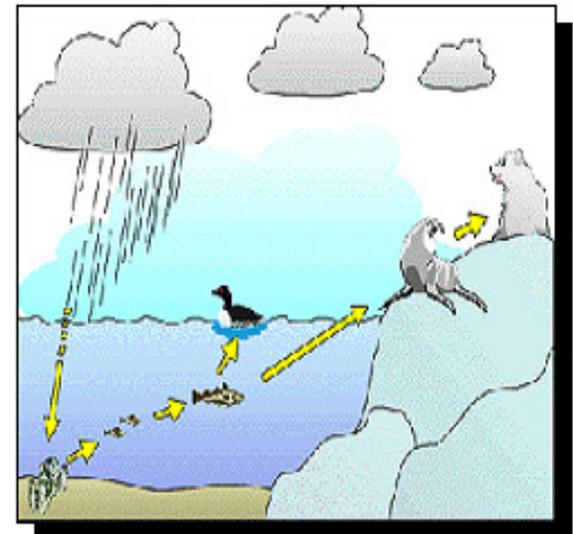
Brominated flame retardants

Used in electronic equipment, textiles, and furniture to prevent fires

Electronic parts of colour televisions and personal computers
Textile coatings; sofas, in seats of cars, buses, and aircraft.

The Arctic POPs project

- ❖ *Investigate* the distribution and level of selected POPs in the Arctic region
- ❖ *Increase the knowledge* of POPs and general environmental science in the involved schools
- ❖ *Contribute to the documentation* of new POPs in the Arctic, needed for international political processes



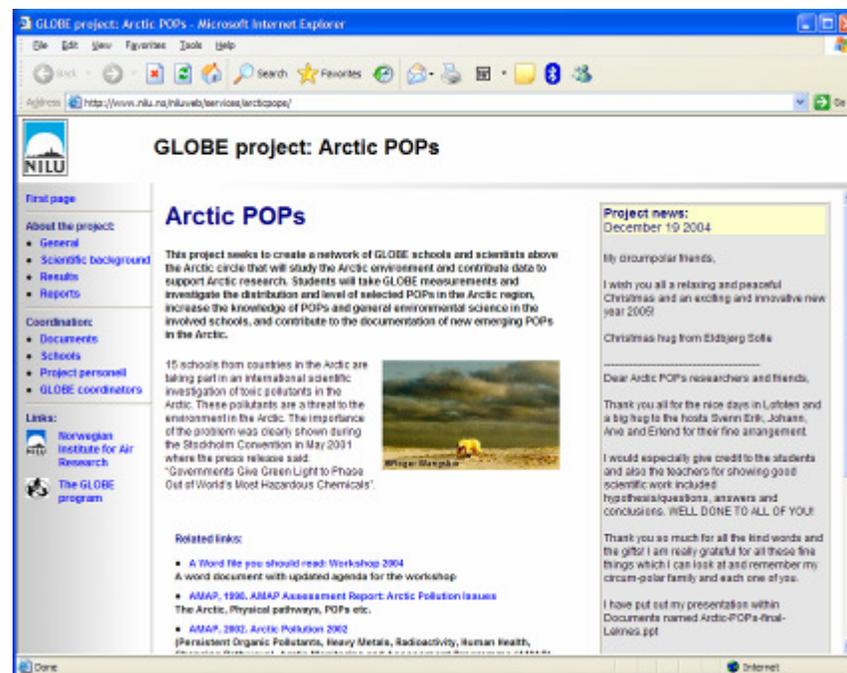
Details on planned project





Sign up and communication

- ❖ All registration on project web pages
- ❖ Communication through e-mail and bulletins
- ❖ PR in cooperation with GLOBE
- ❖ Up to 10 schools per country can participate (due to cost of lab analysis)

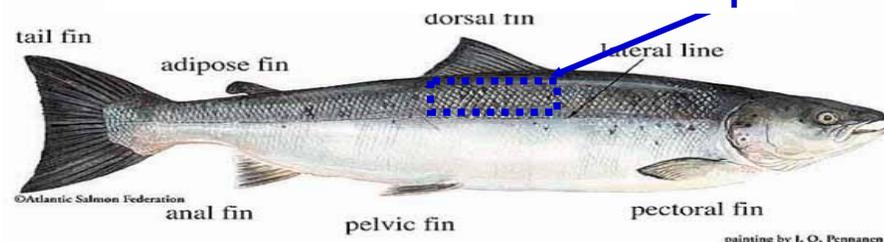


New web solution to be built, building on solution developed for previous project

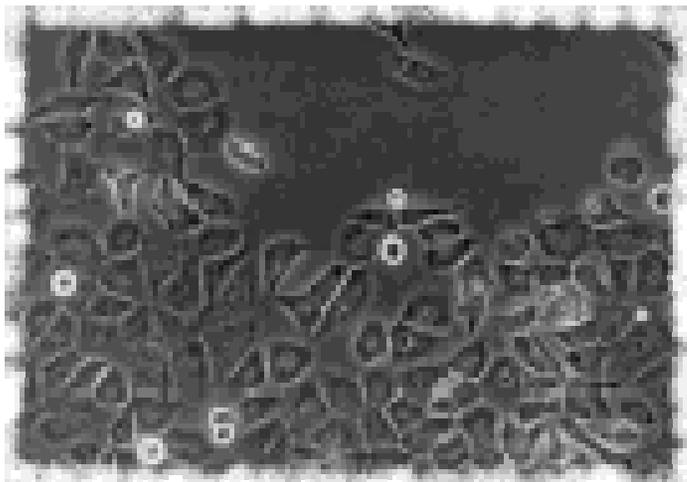
The sampling and sending

- ❖ Schools receives a package with sampling kit and detailed instructions
- ❖ Schools catches fish in local lake/sea
- ❖ Selected metadata about the fish is registrated on sampling sheet to be sent together with the fish sample
- ❖ 100 g of flesh from below dorsal finn to be packed in accordance with instructions and sent in provided packing material in stamped envelope provided.

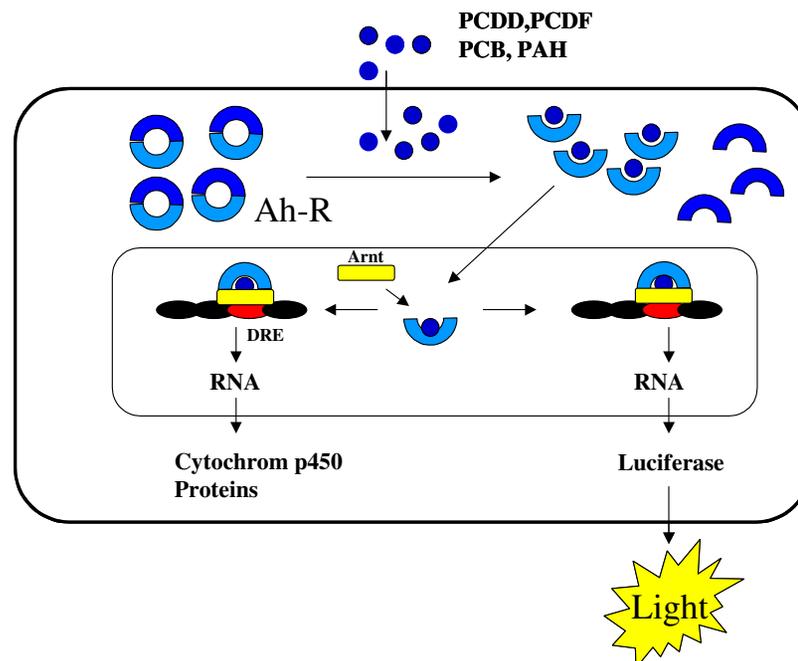
with sterile scalpel



Bioassays analysis at NILU



<http://www.biodetectionsystems.com>



Bioassay methods are based on the cellular mechanism of dioxin toxicity. Dioxin-like compounds bind to a cytosolic protein, the aryl-hydrocarbon (Ah) receptor, then the receptor–chemical complex migrates to the cell’s nucleus and binds with the Ah-receptor nuclear translocator protein (Arnt). This Ah receptor–Arnt complex interacts with specific DNA sequences and alters gene expression of regulated genes. One of the most studied of the family of regulated proteins is the cytochrome P450 gene product CYP1A1.



With those analysis:

- ❖ Samples tested for effect on AH receptor – in other words a health related effect
- ❖ Dioxin and dioxin-like compounds – being the most toxic environmental pollutants – are tested for.
- ❖ This technique is very suitable for screening of many samples
- ❖ The technique is relative new and very suitable for educational purposes since it measures an actual health effect.



School evaluations

- ❖ What are levels in the local fish from our school?
- ❖ What are the levels from the Arctic and Antarctic results provided?
- ❖ Our schools compared to the Polar findings?
- ❖ What are the differences in our results compared to average results, max, min etc?
- ❖ Why is it likely we have the results we have?



Through an interactive report generator on the web pages the schools can make their own scientific report with graphs, pictures and evaluations

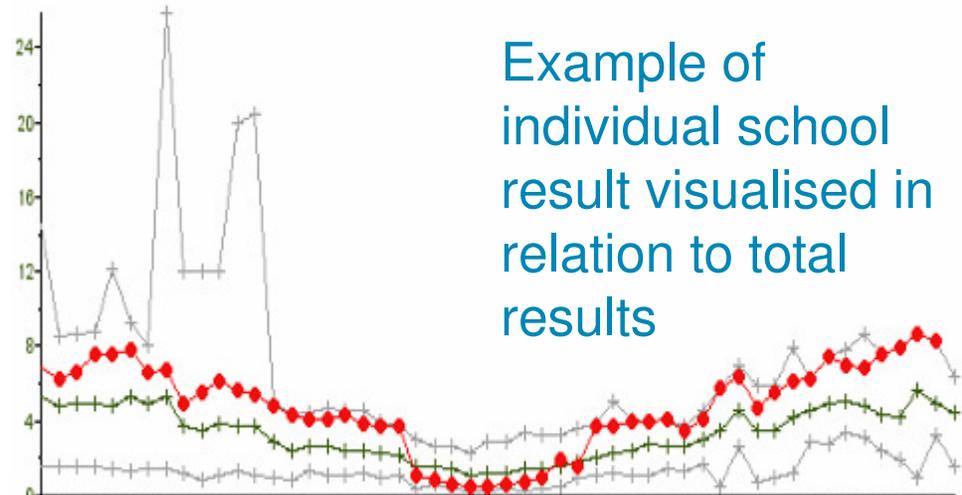
Choose step:

Preface	<input type="checkbox"/>
Introduction	<input type="checkbox"/>
Investigations	<input type="checkbox"/>
Results	
Results from your own investigations	<input type="checkbox"/>
Results from other peoples investigations	<input type="checkbox"/>
Discussion of results	<input type="checkbox"/>
Conclusions	<input type="checkbox"/>
References	<input type="checkbox"/>

Deliver report

Results visualisations

- ❖ All results will be made available on the Internet pages and visualised with graphs, figures, tables and maps

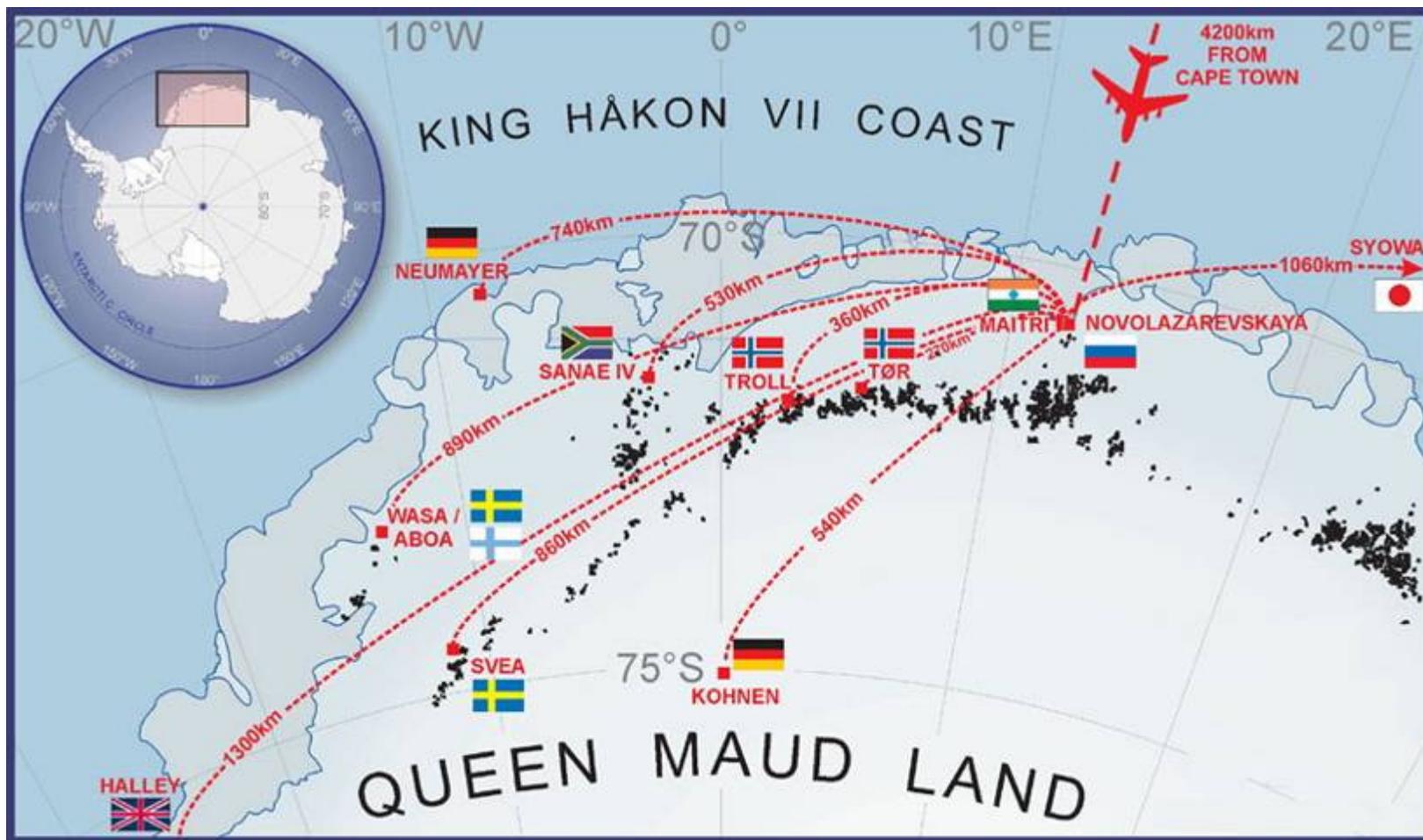


- ❖ Schools can also download the results in excel format and use this for making own calculations and visualisations



Station in Antarctica

EDUCATION IPY – NORWEGIAN PROPOSALS





Station in Antarctica

EDUCATION IPY – NORWEGIAN PROPOSALS





EDUCATION IPY – NORWEGIAN PROPOSALS

Station in Arctic - Svalbard



Toxic compounds in Polar air

